

## 3 Management Measures

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When discussing specific categories of nonpoint source pollution—agriculture, forestry, urban areas, marinas and recreational boating, and hydromodification—management measures represent effective systems of practices available to prevent or reduce NPS pollution. Implementing the management measures in this document will help to reduce pollution coming from a variety of nonpoint sources by promoting the protection and restoration of wetlands and riparian areas and the use of vegetated treatment systems. The following management measures have been developed to protect the multiple functions wetland and riparian ecosystems provide and to ensure their continued capacity for NPS pollution abatement. They are described in greater detail in chapters 4, 5, and 6.

- *Management Measure for Protection of Wetlands and Riparian Areas:* Protect from adverse effects wetlands and riparian areas that are serving a significant NPS abatement function and maintain this function while protecting the other existing functions of these wetlands and riparian areas as measured by characteristics such as vegetative composition and cover, hydrology of surface water and groundwater, geochemistry of the substrate, and species composition.
- *Management Measure for Restoration of Wetlands and Riparian Areas:* Promote the restoration of the preexisting functions in damaged and destroyed wetlands and riparian systems, especially in areas where the systems will serve a significant NPS pollution abatement function.
- *Management Measure for Vegetated Treatment Systems:* Promote the use of engineered vegetated treatment systems such as constructed wetlands or vegetated filter strips where these systems will serve a significant NPS pollution abatement function.

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*Management measures have been developed for the control of NPS pollution through the protection and restoration of wetlands and riparian areas and the use of vegetated treatment systems.*

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### 3.1 How Management Measures Work to Prevent Nonpoint Source Pollution

Implementation of the management measures will help to control the delivery of NPS pollutants to receiving water resources by

- Minimizing pollutants available (source reduction);
- Reducing the flow rate of runoff to allow for deposition of the pollutant or infiltration of runoff; or
- Remediating or intercepting the pollutant through chemical or biological transformation.

Management measures generally focus on the control of a particular type of pollutant or pollutant category from specific land uses. The intent of the three management measures is to ensure that the NPS benefits of protecting and restoring wetlands and riparian areas, and of constructing vegetated treatment systems, will be considered in all water pollution control activities in a watershed. These management measures form an essential element of any state NPS pollution program.

Implementation of the first management measure is intended to protect the full range of functions for wetlands and riparian areas that serve an NPS abatement function. This protection will preserve their value as an NPS pollution control and help to ensure that they do not become a significant nonpoint pollutant source as a result of degradation.

The second management measure promotes the comprehensive restoration of degraded wetlands and riparian systems with NPS pollution control potential for reasons similar to those for the first measure—the increase in pollutant loadings that can result from degradation of wetlands and riparian areas and the substantial evidence in the literature on the effectiveness of wetlands and riparian areas for NPS pollution abatement. In addition, restoration might benefit wildlife and aquatic organisms. This measure recommends evaluation of degraded wetlands and riparian systems, as well as restoration if the systems will serve an NPS pollution abatement function (e.g., by cost-effectively treating NPS pollution or by attenuating peak flows).

The third management measure promotes the use of vegetated treatment systems because of their wide-scale ability to treat a variety of NPS pollutants. This measure will also apply, as appropriate, to the other sources of NPS pollution addressed in the CZARA Guidance (USEPA, 1993c).

## **3.2 Management Practices**

In addition to specifying management measures, chapters 4 through 6 also list and describe management practices. EPA has found the practices listed in this document to be representative of the types of practices that can be applied successfully to achieve the management measures. EPA recognizes that there is often site-specific, regional, and national variability in the selection of appropriate practices, as well as in the design constraints and pollution control effectiveness of practices. The practices presented for each management measure are not all-inclusive. State, tribal, or local agencies may wish to apply other technically and environmentally sound practices to achieve the goals of the management measures.